NASA Facts

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International Space Station

Creating a World-Class Orbiting Laboratory

The International Space Station, the largest international scientific and technological endeavor ever undertaken, is taking shape in factories and laboratories of 13 nations around the world. With the Space Station, a permanent laboratory will be established in a realm where gravity, temperature and pressure can be manipulated in a variety of scientific and engineering pursuits which are impossible in ground-based laboratories. The Space Station will be a testbed for the technologies of the future and a laboratory for research on new, advanced industrial materials, communications technology, and medical research.

Program

The Space Station will be a permanent orbiting laboratory in space capable of performing long-duration research in the unique environment of Earth orbit. The Space Station will:

- maintain U.S. leadership in space and in global competitiveness
- serve as a driving force for emerging technologies
- forge new partnerships with the other spacefaring nations of the world
- inspire our children
- foster the next generation of scientists, engineers and entrepreneurs
- satisfy humanity's need to explore

Aboard the international orbiting laboratory, science crews will:

- conduct medical research in space
- develop new materials and processes to benefit industries on Earth
- accelerate breakthroughs in technology and engineering that will have immediate, practical applications for life on Earth-and will create jobs and economic opportunities today and in the decades to come

Assembly of the Space Station will begin in November 1997 and will be completed in June 2002. In orbit 230 nautical miles above the Earth, the Space Station will circle the globe at an inclination of 51.6 degrees. This orbit has two advantages:

- It can be reached by the launch vehicles of all the international partners, providing a robust capability for sending crews and supplies to the Station.
- The orbit provides excellent Earth observation with coverage of 85% of the globe and overflight of 95% of the planet's population.

When completed, the Space Station will be 361 feet across and 290 feet long. It will weigh about 924,000 pounds. Six people will live on the Space Station.

Current Activities

By March 1995, about 48,000,000 pounds of flight-quality hardware had been built. A total of 75,000 pounds of hardware will be built by the end of 1995.

- Following a complete redesign in 1993, the Space Station program is staying within budget and meeting schedules.
- NASA's management structure has been substantially streamlined.
- A single NASA program office has been established to oversee a single prime contractor—Boeing—to build and integrate the Station.

Future Activities: Construction

The Space Station is a key component of NASA's long-range plan to provide for the human exploration and development of space:

- Elements of the Space Station will be launched into space beginning in November 1997.
- The first segment to be launched will be the Russian-built, U.S.-owned Functional Cargo Block, a 20-ton, 43-foot long module which contains propulsion, command and control systems and habitable space.
- The first U.S.-built segment will be launched on the second assembly flight in December 1997.
- By mid-1998, after only 4 assembly flights, a functioning space facility for up to 3 people will be in place for the start of long-duration space flights.
- With the addition of the U.S. laboratory and scientific equipment, a world-class space laboratory will be in operation by the end of 1998.

Future Activities: Science Operations

- The Space Station will provide scientists the electric power and time on orbit to perform research on such things as the growth of protein crystals, which aid in determining the structure and function of proteins. Such information will greatly enhance drug design and research in treatment of diseases. Crystals already grown on the Space Shuttle are superior to anything grown on Earth for research into cancer, diabetes, emphysema, parasitic infections and immune system disorders.
- The almost complete absence of gravity on the Space Station will allow new insights into human health and disease prevention and treatment-including heart, lung, and kidney function, cardiovascular disease, osteoporosis (bone loss), hormonal disorders and brain function.
- Onboard, crew members will study materials that could not exist and processes that could not take place on Earth because of the overwhelming influence of gravity. Materials to be investigated include polymers (used on Earth for everything from paint to contact lenses), semiconductors for high-speed supercomputers and electronics, and high-temperature superconductors that will make electrical devices operate more efficiently.
- The Space Station will inspire a new generation of Americans to explore and achieve, while pioneering new methods of education to teach and motivate the next generation of scientists, engineers, entrepreneurs and explorers.

Budget

- The Space Station's annual cost has been fixed at $2.1 billion—about 1/7th of 1% of the federal budget and about 15% of the total NASA budget.
- The international partners have endorsed the design of the Space Station and have committed to spending over $9 billion of their own funds on the program.
- The new Space Station design saved $5 billion in development costs and reduced annual operating costs by one-half.
- With Russia's contributions, the redesigned Space Station provides for twice the power (92 kilowatts versus 56 kilowatts), nearly double the volume (43,000 cubic feet versus 23,000 cubic feet), twice the number of research modules (6 versus 3) and accommodations for two additional crew members (6).

Partnerships

As the World redefines itself in the wake of the Cold War, the Space Station is a catalyst for international cooperation and a powerful symbol of U.S. leadership in a changing world. Development of the Space Station will:

- demonstrate how nations can work together on peaceful initiatives
- serve as a test case for building mutual trust and shared goals
- provide international commercial opportunities for U.S. companies

After a complete overhaul of the Space Station's management structure in 1993, the United States and its original partners in the project-Canada, Japan and 9 member nations from the European Space Agency-invited Russia to join the international project. Russia accepted and will add significant capabilities to the orbiting laboratory. Canada, Japan, the European Space Agency and Russia will contribute the following elements to the Space Station:

- Canada is providing a 55-foot long robotic arm to be used for assembly and maintenance tasks on the Space Station.
- The European Space Agency is building a pressurized laboratory.
- Japan is building a laboratory with an attached exposed facility.
- Russia is providing three research modules, a service module with its own life support and habitation systems, and a Science Power Platform that supplies about 20 kilowatts of electrical power, progress cargo vehicles, and Soyuz spacecraft for crew return and transfer.